

SAN JUAN AND ITS DEFENSES.

Every few weeks the theater of action of the war changes, and now once more Porto Rico is the objective point of an expedition sent to conquer it. This island is the most productive of all the possessions which Spain has had in the nineteenth century. San Juan, which our fleet bombarded on May 12, is strongly fortified, but at that time Rear Admiral Sampson had no intention of capturing the town. He wished only to draw the fire of the batteries so as to locate them and destroy as many as possible. He was successful in his attempt, and he did not intend to try to land any soldiers or marines. Now, however, a large army will invest the city and will co operate with the fleet in its bombardment.

San Juan, the capital of the island of Porto Rico, lies on the northeast shore of the island and has a population of about 28,000. The harbor is one of the finest in the West Indies, being large, sheltered, and capable of accommodating any number of the largest ships, having an anchorage of from three to seven fathoms. It bears a very striking likeness to Havana Harbor, to which it is but little inferior. Its entrance toward the north is invitingly open to the vessels of our great republic, being over 2,000 feet wide, and the harbor is defended on the west side by forts erected on two small islands. The city occupies what is generally supposed to be an island, but the city is really built on a coral reef. It is a long, irregular peninsula, and it is connected with the mainland by a short bridge at the eastern end. The town is completely inclosed with massive walls of stone and mortar which rise to a height, in some places, of from 50 to 100 feet. It is a perfect specimen of a walled town with portcullis, moat, gates, and battlements. The fortifications were begun over 250 years ago, and were still in good condition until they were attacked by Admiral Sampson. Like Havana and Santiago, San Juan has a "Morro" Castle, or citadel (really a round Moorish tower). The walls have many sentry boxes at intervals hanging out over the sea on the grim, gray walls. One can find a counterpart on a small scale in the old fort at St. Augustine, Florida, and they are in every way similar to those at Havana before her walls were torn down. The peninsula on which Morro and the lighthouse stand is thrust out into the sea, one side breasting the thundering surges of the Atlantic Ocean and the other guarding the placid waters of the beautiful and almost landlocked harbor. The fortifications have one advantage over a fleet in being at a considerable elevation, thus enabling them to deliver a plunging fire. In Admiral Sampson's attack on San Juan only one man was killed on the American vessels, and the Admiral's ships did great damage, destroying many of the batteries.

Inside the walls the city is laid off in regular squares, six parallel streets running in the direction of the length of the peninsula and seven at right angles. The houses are closely and compactly built of stone and are usually one or two stories high, stuccoed on the outside and painted in a variety of colors. The upper floors are occupied by the more respectable people, while the ground floors are almost without exception given up to negroes and the poorer classes. The population within the walls is estimated at 20,000, and most of the people live on the ground floors. In one small room, with a flimsy partition, a whole family will re-

side. As may be supposed, these ground floors of the whole town reek with fever, and the conditions are most unsanitary. As Porto Rico is a tropical country, where disease would readily get a foothold, the consequences of such herding may be easily imagined. There is some water supply, but the population depends also on rain water caught on the flat roofs of the

tions, no contagious disease, if properly taken care of, could exist, and without them the place would be a veritable plague spot.

Though the main portion of San Juan is inclosed within the walls, through which entrance is obtained only by well guarded gateways, yet there is a small town by itself between the Marina and the walls which contains two or three thousand inhabitants. Here is to be found a public garden and pleasure space for booths and restaurants, as well as a public cockpit where battles royal are frequently waged. There are also two suburbs, San Turce and Catano, across the bay, reached by a ferry.

The present expedition to San Juan will not be the only one which has been sent to capture the capital. In 1596 it was sacked by Drake and in 1598 by the Duke of Cumberland. In 1615 a Dutchman, Baldwin Heinrich, lost his life in an attack on Morro Castle. The attack of the English in 1678 was equally unsuccessful, and Abercrombie in 1797 had to retire after a siege of three days.

To Beautify Railway Stations.

Resolutions were adopted at the last meeting of the Society for the Preservation of Historic Places and Objects, and these resolutions were sent to the presidents of fourteen of the leading railways which lie wholly, or in part, in the State of New York. The resolutions go on to say that most of the railroad stations in the State of New York are devoid of scenic attraction and landscape embellishment, and in this respect they are certainly inferior to those in other States, notably Pennsylvania. They make an excellent point of saying that the avenues of steam traffic through the cities and villages of the State are almost always bordered by unattractive conditions which, unless they are counteracted by more pleasing surroundings at the stopping places of trains, create an unfavorable impression of the community in the mind of the traveler. Experience has demonstrated that great improvements can be made in the way of lawn adornment by the systematic arrangement of trees and shrubs and the better disposition of paths and drives, and this can be effected at a comparatively small cost. Municipal authorities are asked to co-operate with the railroad companies in a park-like treatment at the centers of the passenger traffic.

Speeds per Second.

The snail, one-half inch; a man walking, 4 feet; a fast runner, 23 feet; a fly, 24 feet; a fast skater, 38 feet; a carrier pigeon, 87 feet; locomotive—sixty miles an hour—88 feet; swallows, 220 feet; the worst cyclone known, 380 feet; the Krakatoa wave—at the volcanic catastrophe of August 27, 1883, in the Sunda Islands—940 feet; the surface of the globe on sea level at the equator, 1,500 feet; the moon, 3,250 feet; the sun, 5½ miles; the earth, 18 miles; Halley's comet in the perihelion, 235 miles; electric current on telegraph wires, 7,000 miles; induction current, 11,040 miles; electric current in copper wire armatures, 21,000 miles; light, 180,000 miles; discharge of a Leyden jar through copper wire one-sixteenth of an inch in diameter, 277,100 miles, which is said to have been the highest velocity measured.—The Wave.

THERE are more blind people among the Spaniards than any other European race.

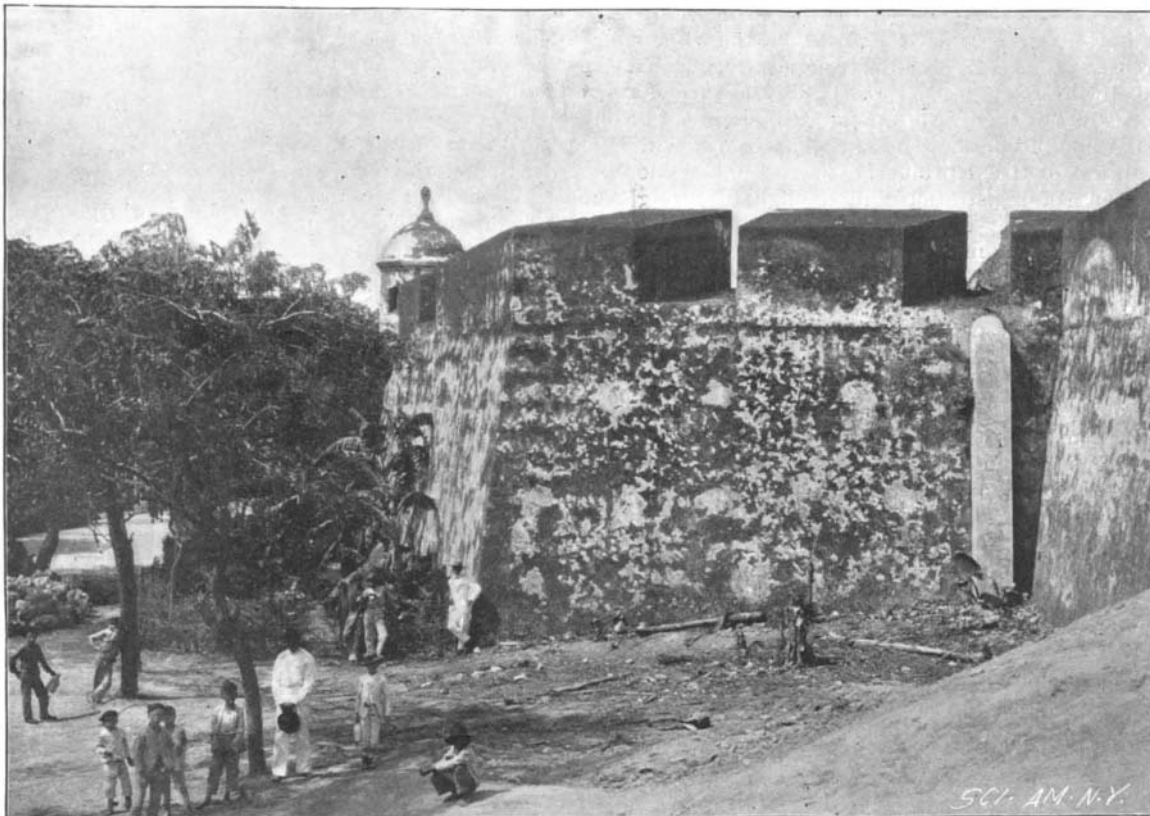


STREET SCENE, SAN JUAN, PORTO RICO.

buildings and conducted to the cistern which occupies the greater part of the courtyard which is an essential part of the Spanish house the world over. There is no sewage except for surface water and sinks, and the risk of contaminating the water in the cisterns by adjacent vaults is very great. Epidemics are frequent, and the town is alive with vermin, mosquitoes, and dogs.

The streets are wider than in the older part of Havana, and will accommodate two carriages abreast. The sidewalks are very narrow, and will only accommodate one person. The pavements are of a composition manufactured in England. They are unfit for very heavy traffic, but are pleasant and durable when no heavy strain is brought upon them. The streets are swept once a day, by hand, and, strange to say, are very clean. From its topographical situation, the

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THE OLD WALL, SAN JUAN, PORTO RICO.

town should be healthy, but it is not. The soil under the city is clay, mixed with lime, and it is so hard as to be almost like rock. It is, consequently, impervious to water, and furnishes a good natural drainage. The trade winds blow strong and fresh, and through the harbor runs a stream of sea water at a speed of not less than three miles an hour. With these condi-

000 miles; light, 180,000 miles; discharge of a Leyden jar through copper wire one-sixteenth of an inch in diameter, 277,100 miles, which is said to have been the highest velocity measured.—The Wave.

The Megaphone in War.

The "megaphone," the modern speaking trumpet, has played an important part in the present war. The navy have been using the megaphone only about a year, and already it has been regarded as a necessary adjunct on every ship. The standard size is about 2½ feet long, and the large end is about 15 inches in diameter. It has a light handle and an aluminum mouth-piece. The smaller craft only carry one, but the larger vessels have a number. Thus, the flagship "New York" has one on the bridge, one on the signal bridge, and one on the quarter deck. In the old days, the officer of the deck used the speaking trumpet, and they were often as elaborate as those owned by volunteer firemen. On sailing vessels, in a storm, the voice will not carry from the quarter deck to the foremast head, nor can it be heard to windward of a large sail, so that a speaking trumpet is always kept at hand. They were small and convenient, but are inferior to the modern megaphone. Every inflection of the voice is magnified by the megaphone to wonderful degree, and the sounds may be heard at a great distance. The orders to the vessels of the fleet doing blockade duty off the Cuban coast have been issued through megaphones. Torpedo boats and the converted yachts and tugs assigned to special duties receive a large proportion of their orders from the flagship by megaphone, and turned in their first brief reports in the same way.

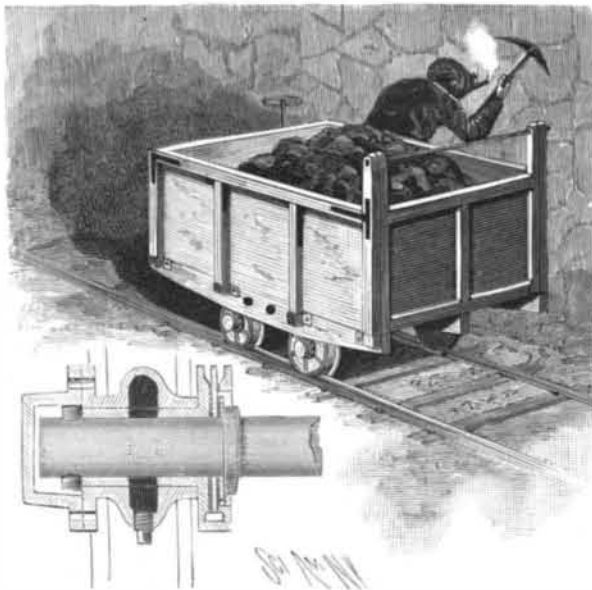
The Industrial Commission.

Under the provisions of the law creating an industrial commission Vice-President Hobart has appointed Senators Kyle, Penrose, Mantle, Daniel, and Mallory. Speaker Reed has appointed five representatives, Gardner, Lorimer, Lovering, Livingstone, and Bell. Nine members who shall fairly represent the various industries of the United States are yet to be appointed by the President. The idea of the commission is to investigate questions relating to immigration, to labor, to agriculture, to manufacture, and business. It will report to Congress and suggest such legislation as the commission may deem best upon these subjects and an attempt will be made to secure uniform legislation by the various States in the Union, in order to harmonize conflicting interests and which will be equitable to the laborer, producer, employer, and consumer. Hearings will be given and the commission has the power to send for witnesses and papers and administer oaths.

AN IMPROVED OIL-RETAINING BOX.

To provide an oil-retaining box arranged to keep the lubricant in good condition and always in position on the journal or bearing until it has been completely used up, Samuel Salmon, of Drifton, Pa., has invented and patented an arrangement by means of which the desired end in question is attained.

The device is applied to a mining car-wheel, the axle having its journal-bearing revolving in a box in the form of a bushing which is fitted in the hub of the wheel. On the inner end of the hub the enlarged end of the bushing fits and forms the guideway for a closing shield applied to the journal next to the shoulder on the axle. Openings are made in the bushing at the middle portion which register with an annular oil-chamber formed in the hub. The lubricant is thus enabled to pass from the chamber to the jour-



SALMON'S OIL-RETAINING BOX.

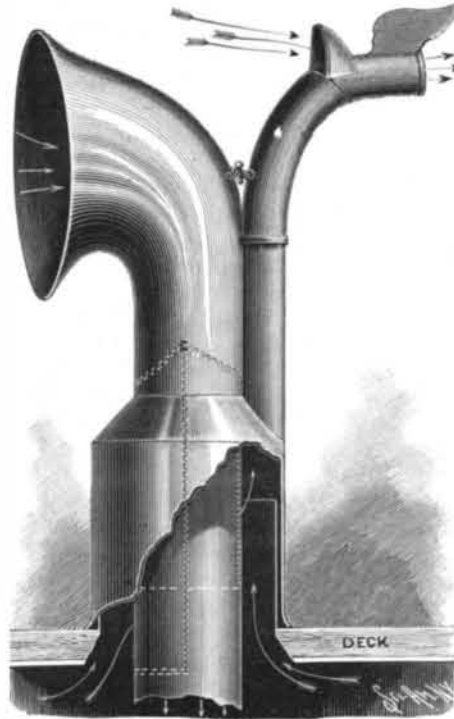
nal. On the outer end of the journal a linch-pin is secured, as shown in the sectional view, and lies against the end of the bushing so as to hold the bearing or journal in proper position. The collar or shoulder on the inner end of the axle, it is to be observed, lies against the outer face of the enlarged end of the bushing.

Since the closing shield lies snugly on the axle, the lubricant is prevented from leaking past the inner end of the journal and, it is claimed, is therefore enabled to be used without waste.

A NOVEL HOUSE-COOLER AND VENTILATOR.

A patent has recently been granted to James B. Slade, of Riverhead, N. Y., for a device by means of which buildings, ships, mines, and boiler rooms are constantly supplied with fresh air, a free-exit being provided for the foul and vitiated air.

The contrivance consists of a tubular casing adapted for insertion in a circular opening in the roof of a building or the deck of a vessel. Inside of the casing a sleeve is so supported as to leave an air-passage between the casing and the sleeve. Mounted in the



SLADE'S HOUSE-COOLER AND VENTILATOR.

sleeve is a tube provided internally with a spider or frame, and at its upper end with a rotatable ingress-tube. This ingress-tube likewise has a spider or frame on which a rod is centrally pivoted. The upper end of the casing is inclosed by a hood formed with a conical end, through which the ingress-tube passes. With the conical end of the hood an egress-tube is connected which communicates with the interior of the hood. These ingress and egress-tubes are curved in opposite directions, and are mounted to swing in such a manner that the ingress-tube shall constantly present its opening to the wind.

The ingress-tube continually forces a column of air downward through the building, and the egress-tube permits all warm or vitiated air to escape. Any vacuum formed by ventilation, it is said, will be immediately filled by the air pressed into the cold tube entering a room at the bottom. The ventilator at the rear or leeward of the hood constitutes an air-passage, creating a vacuum below and drawing up the warm air.

A Railroad in the Philippines.

The Manila and Dagupan Railway, the only railway in the Philippine Islands, is running along smoothly as if peace prevailed throughout the land, says the Manila correspondent of The Railway Age. Ordinarily railroads suffer as much inconvenience and loss in business and damage as any other line of business at times when comparatively small countries are in a state of rebellion. This loss is not only because of demoralization in freight business and from common disinclination of people to travel where the existence of social disorder creates an additional element of risk in traveling on public carriers, but because of destruction of railroad property, as a matter of proper warfare and military strategy, as has been the case in Cuba. The Philippine railroad has been remarkably fortunate in the respect of enjoying immunity from inconvenience and violence at the hands of the insurgents—so fortunate, indeed, as to agreeably surprise and disappoint the management of that property.

The road is of 3 foot 6 inch gage, and runs from Manila, with a population of over 200,000, in an almost northerly direction, 125 miles, through several large municipalities to Dagupan, a reasonably prosperous seaport of about 30,000 souls. The island of Luzon, of which Manila is the capital, has a population of about 3,500,000, nearly half the entire population of the twenty-one islands that form the Philippine group, and with an area of nearly double that of Great Britain. The railroad, as might be expected, runs through the most populous section of Luzon.

While the railroad is private property and owned and managed by Europeans other than Spaniards, it was thought the insurgents would nevertheless try and prevent its operation, at least spasmodically, inasmuch as it was proving of so great advantage to the government in the effort to quell the revolt. There has, however, been no trouble with the road as yet. The forbearance of the rebels has caused no little

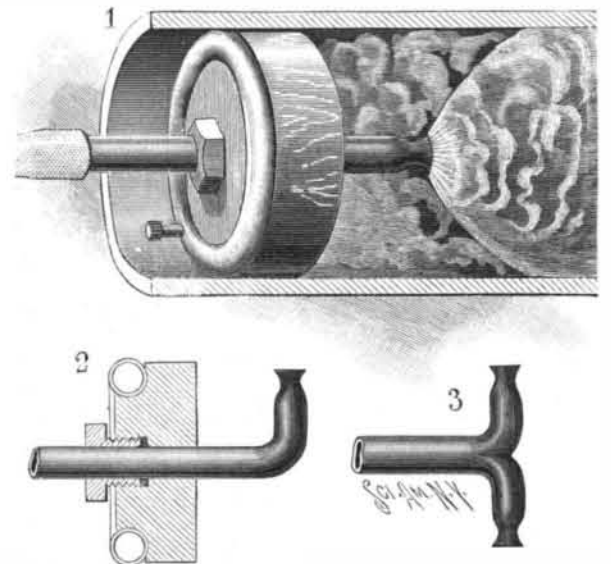
surprise among Spanish officials. The insurgents derailed a passenger train several months ago. Since that time there has been absolutely no violence. The rebel leaders were very much displeased when they learned that some of their subordinates had molested a train, and at once gave orders that the personal and property rights of foreigners other than Spaniards should be respected and that this order was intended to apply particularly to the railroad, which they well understood was the property of English capitalists. The fact that the railroad company has not since been subjected to the slightest trouble or inconvenience, while the immediate country is involved in very serious and formidable revolution, demonstrates these facts: 1. That the Filipinos are not savages, warring just for the excitement of the thing. 2. That they are a peaceful and easily governed people, and are regarding with respect the wishes of their recognized leaders. 3. That they value the good will and sympathy of Europeans who live in the Philippines and will unquestionably see to it that these foreigners are protected to the fullest possible extent.

Gold Extraction with Potassium Permanganate.

A new process for the extraction of gold has been tried with success in the gold districts of New Zealand. The finely powdered auriferous ore is first mixed with common salt and sulphuric acid, and potassium permanganate is then added in solution. Hydrochloric acid is formed by the action of the sulphuric acid on the salt, and from this chlorine is liberated by the permanganate. The chlorine then combines in the nascent state with the gold, forming soluble gold chloride. The new method is said to have many advantages over the cyanide and amalgamation processes. The chemicals used are harmless, non-poisonous, and cheap, and the extraction of gold from the ore is nearly complete. A particular advantage lies in the fact that the process can be applied to ores containing copper for which the cyanide process cannot be used. A gold mine at Mount Morgan, New Queensland, obtained by the permanganate process 95 per cent of the gold present from ore yielding only 20 per cent by the cyanide process. The ore contained also copper, iron, antimony, and manganese.—Südd. Ap. Ztg.

A NEW FLUE-CLEANER.

In an invention patented by Charles H. Carrico, of Salt Lake City, Utah, novel means are provided for blowing out chimneys, smokestacks and other flues, the device employed being of that type in which a steam-pipe is passed into the flue and held by a stopper which closes the flue and prevents the reaction of the steam while cleaning out the soot or other foreign matter. Of the accompanying illustrations, Fig. 1 shows the flue-cleaner in operation; Figs. 2 and 3 are modifications of the steam-pipe used. The stopper is circular in form, is made preferably of wood, and is adapted to fit in one end of a flue, as shown in Fig. 1. Through the central portion of the stopper an opening is made into which the steam-pipe is inserted. A rubber gasket encircles the pipe and bears against a shoulder formed on the body-portion of the stopper. A hollow screw-plug embraces the pipe and presses against the gasket to hold the steam-pipe in place and to effect an



CARRICO'S FLUE-CLEANER.

hermetic connection between the pipe and the stopper. On the periphery of the stopper near the inner end, a groove is formed, into which is fitted an elastic expansible tube. When by means of a valve this tube is inflated, the opening of the flue is hermetically sealed. When the jet of steam is exerting its utmost force in blowing out the flue, the stopper will still be held in position by the elastic expansible tube. The modifications shown in Figs. 2 and 3 are designed to produce a lateral jet of steam when other forms of nozzles would not be serviceable.